

REMARKS

Claims 12, 20, 23, 28-34, 47, 52, 53, 57-63, 80-82 and 90-247 are pending in the above-captioned patent application following this amendment. Claims 1-15, 17, 18, 20, 22-26, 35-40, 42-47, 49, 51-55, 64-76 and 78-89 have been rejected. The Applicants respectfully traverse the rejection of claims 12, 20, 23, 47, 52, 53 and 80-82. Claims 16, 19, 21, 27-34, 41, 48, 50, 56-63 and 77 were found to contain patentable subject matter. The Applicants have amended claims 12, 20, 23, 28, 47, 52, 57 and 80 by rewriting them in independent form, have canceled claims 1-11, 13-19, 21, 22, 24-27, 35-46, 48-51, 54-56, 64-79 and 83-89 without prejudice and have added claims 90-247 for the purpose of expediting the patent application process in a manner consistent with the goals of the Patent Office pursuant to 65 Fed. Reg. 54603 (September 8, 2000), even though the Applicants believe that the previously pending claims were allowable as originally filed.

Support for the amendments to the claims and for the new claims can be found throughout the originally filed claims, the drawings and the specification. More specifically, the Applicants have added new claim 90, which is based on original claim 16 rewritten in independent form. Therefore, new claim 90 is not narrower in scope than previously pending claim 16. Claim 16 was found to contain patentable subject matter. Thus, claim 90 is believed to be patentable.

New claim 91 is based on original claim 19 rewritten in independent form. Therefore, new claim 91 is not narrower in scope than previously pending claim 19. Claim 19 was found to contain patentable subject matter. Thus, claim 91 is believed to be patentable.

New claim 92 is based on original claim 21 rewritten in independent form. Therefore, new claim 92 is not narrower in scope than previously pending claim 21. Claim 21 was found to contain patentable subject matter. Thus, claim 92 is believed to be patentable.

New claim 93 is based on original claim 27 rewritten in independent form. Therefore, new claim 93 is not narrower in scope than previously pending claim 27. Claim 27 was found to contain patentable subject matter. Thus, claim 93 is believed to be patentable.

New claim 94 is based on original claim 41 rewritten in independent form. Therefore, new claim 94 is not narrower in scope than previously pending claim 41. Claim 41 was found to contain patentable subject matter. Thus, claim 94 is believed to be patentable.

New claim 95 is based on original claim 48 rewritten in independent form. Therefore, new claim 95 is not narrower in scope than previously pending claim 48. Claim 48 was found to contain patentable subject matter. Thus, claim 95 is believed to be patentable.

New claim 96 is based on original claim 50 rewritten in independent form. Therefore, new claim 96 is not narrower in scope than previously pending claim 50. Claim 50 was found to contain patentable subject matter. Thus, claim 96 is believed to be patentable.

New claim 97 is based on original claim 56 rewritten in independent form. Therefore, new claim 97 is not narrower in scope than previously pending claim 56. Claim 56 was found to contain patentable subject matter. Thus, claim 97 is believed to be patentable.

New claim 98 is based on original claim 77 rewritten in independent form. Therefore, new claim 98 is not narrower in scope than previously pending claim 77. Claim 77 was found to contain patentable subject matter. Thus, claim 98 is believed to be patentable.

Further, support for the amendments to claims 12, 20, 23, 28, 47, 52, 57 and 80 and for new claims 99-247 can be found at least in original claims 1-40 and 69-87, in Figures 1-4, 8-16 and 18, and in the specification at page 7, line 19, through page 8, line 9, at page 8, line 22 through page 9, line 6, at page 11, line 21 through page 12, line 5, at page 20, line 20 through page 26, line 31, and at page 32, line 11 through page 43, line 14.

No new matter is believed to have been added by this amendment. Consideration of the pending application is respectfully requested.

Allowable Subject Matter

The Patent Office has determined that claims 16, 19, 21, 27-34, 41, 48, 50, 56-63 and 77 contain allowable subject matter. New claim 90 is based on original claim 16 rewritten in independent form. New claim 90 is not narrower in scope than previously pending claim 16. Claim 16 was found to contain patentable subject matter. Thus, claim 90 is believed to be patentable.

New claim 91 is based on original claim 19 rewritten in independent form. Therefore, new claim 91 is not narrower in scope than previously pending claim 19. Claim 19 was found to contain patentable subject matter. Thus, claim 91 is believed to be patentable.

New claim 92 is based on original claim 21 rewritten in independent form. Therefore, new claim 92 is not narrower in scope than previously pending claim 21. Claim 21 was found to contain patentable subject matter. Thus, claim 92 is believed to be patentable.

New claim 93 is based on original claim 27 rewritten in independent form. Therefore, new claim 93 is not narrower in scope than previously pending claim 27. Claim 27 was found to contain patentable subject matter. Thus, claim 93 is believed to be patentable. Claims 28-34 depend upon claim 93. Accordingly, claims 28-34 are believed to be patentable.

New claim 94 is based on original claim 41 rewritten in independent form. Therefore, new claim 94 is not narrower in scope than previously pending claim 41. Claim 41 was found to contain patentable subject matter. Thus, claim 94 is believed to be patentable.

New claim 95 is based on original claim 48 rewritten in independent form. Therefore, new claim 95 is not narrower in scope than previously pending claim 48. Claim 48 was found to contain patentable subject matter. Thus, claim 95 is believed to be patentable.

New claim 96 is based on original claim 50 rewritten in independent form. Therefore, new claim 96 is not narrower in scope than previously pending claim 50. Claim

50 was found to contain patentable subject matter. Thus, claim 96 is believed to be patentable.

New claim 97 is based on original claim 56 rewritten in independent form. Therefore, new claim 97 is not narrower in scope than previously pending claim 56. Claim 56 was found to contain patentable subject matter. Thus, claim 97 is believed to be patentable. Claims 57-63 depend upon claim 97. Accordingly, claims 57-63 are believed to be patentable.

New claim 98 is based on original claim 77 rewritten in independent form. Therefore, new claim 98 is not narrower in scope than previously pending claim 77. Claim 77 was found to contain patentable subject matter. Thus, claim 98 is believed to be patentable.

Rejections Under 35 U.S.C. § 102

Claims 1, 4, 6, 8-11, 13-15, 17, 18, 20, 22-26, 37-40, 42-47, 49, 51-55, 66-70, 72-76 and 78-88 have been rejected under 35 U.S.C. § 102(e) as being anticipated by Matsui et al (US Patent No. 6,408,045). Further, claims 2, 3, 5, 7, 12, 71 and 89 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Loopstra et al (US Patent No. 5,969,441). As stated above, the Applicants have canceled claims 1-11, 13-15, 17, 18, 22, 24-26, 37-40, 42-46, 49, 51, 54, 55, 66-76, 78, 79 and 83-89. Therefore, the rejection by the Patent Office of claims 1-11, 13-15, 17, 18, 22, 24-26, 37-40, 42-46, 49, 51, 54, 55, 66-76, 78, 79 and 83-89 is believed to be moot.

However, the Applicants hereby respectfully traverse the rejection of claims 12, 20, 23, 47, 52-53 and 80-82 as follows. The Applicants submit that the features of claims 12, 20, 23, 47, 52-53 and 80-82 are not taught or suggested by the cited references. Claim 12 has been amended to include all of the limitations of its base claim and any intervening claims. Claim 20 has been amended to include all of the limitations of its base claim and any intervening claims. Claim 23 has been amended to include all of the limitations of its base claim and any intervening claims. Claim 47 has been amended to include all of the limitations of its base claim and any intervening claims. Claim 52 has been amended to include all of the limitations of its base claim and any intervening claims. Further, claim 80

has been amended to include all of the limitations of its base claim and any intervening claims.

More specifically, Matsui et al is directed toward a vertical type stage system that includes a stage base 3, and a main stage 5 that moves along an X axis and a Y axis. (Figure 1). The stage system includes Y mass members 23 (countermasses) for applying an inertial force in the Y direction to the stage base 3. (Col. 5, lines 45-47). The Y mass members 23 move along the Y axis only. (Figure 1). The stage system also includes X mass members 27 (secondary counterweights) for applying an inertial force in the X direction to the stage base 3. The X mass members 27 can be moved along the X axis. (Figure 1). Further, the X mass members move along the Y axis with the main stage 5 in an opposite direction from the Y mass members 23. (Figure 1). Each of the mass members 23, 27 includes a movable element (not shown) of a linear motor and a linear motor stator (not shown). The linear motors are used to move only the mass members 23, 27 to apply inertial force. Matsui et al does not teach or suggest that the Y mass members 23 are moved along the X axis or about a Z axis. Moreover, Matsui et al does not teach or suggest that the X mass members 27 are moved about a Z axis. Additionally, Matsui et al does not teach or suggest a mass guide assembly that inhibits movement of the X reaction component relative to the Y reaction component along the Y axis. Further, Matsui et al does not teach or suggest a reaction frame being coupled to the X reaction masses so that the reaction frame moves relative to the stage base along the X axis.

Loopstra et al is directed toward a positioning device 3 that includes displacement units 25, 27, and two substrate holders 11, 13. The displacement units 25, 27 position the substrate holders 11, 13 in an X-Y plane. (Figures 1 and 2). The positioning device 3 also includes a balancing unit 69 that is guided over a guiding surface 79 of a base 81 by means of static gas bearings (not shown). Movement of the displacement units 25, 27 result in reaction forces that cause the balancing unit 69 to move as a single component relative to the base 81 along the X axis, along the Y axis, and about the Z axis. (Col. 13, lines 30-35; Col. 14, lines 10-15). Moreover, the positioning device includes anti-drift means 91, 93, 95 that exert a spring force on the balancing unit 69 along the X axis and along the Y axis. (Col. 15, lines 9-16). Loopstra et al does not teach or suggest using anti-drift means that move one or more reaction masses about a Z axis.

In contrast to the cited references, amended claim 12 is directed toward a stage assembly that requires “a stage adapted to retain the device; a stage mover assembly connected to the stage, the stage mover assembly moving the stage with at least two degrees of freedom and generating reaction forces in at least two degrees of freedom; a reaction mass assembly coupled to the stage mover assembly, the reaction mass assembly being adapted to reduce the reaction forces in at least two degrees of freedom that are transferred to the stage base; and a reaction mover assembly that adjusts the position of the reaction mass assembly relative to the stage base along an X axis, along a Y axis and about a Z axis.” These features are not taught or suggested by the cited references. Thus, claim 12 is considered to be patentable.

Further, amended claim 20 is directed towards a stage assembly that requires “a stage adapted to retain the device; a stage mover assembly connected to the stage, the stage mover assembly moving the stage with at least two degrees of freedom and generating reaction forces in at least two degrees of freedom; a reaction mass assembly including an X reaction component and a Y reaction component that are coupled to the stage mover assembly, the X reaction component moving relative to the Y reaction component along an X axis, the X reaction component and the Y reaction component moving concurrently along a Y axis relative to the stage base, the reaction mass assembly being adapted to reduce the reaction forces in at least two degrees of freedom that are transferred to the stage base; and a mass guide assembly that allows the X reaction component to move relative to the Y reaction component along the X axis and inhibits movement of the X reaction component relative to the Y reaction component along the Y axis.” These features are not taught or suggested by the cited references. Thus, claim 20 is believed to be patentable.

Amended claim 23 requires “a stage adapted to retain the device; a stage mover assembly connected to the stage, the stage mover assembly moving the stage with at least two degrees of freedom and generating reaction forces in at least two degrees of freedom; a reaction mass assembly including an X reaction component and a Y reaction component that are coupled to the stage mover assembly, the X reaction component including a pair of spaced apart X reaction masses and the Y reaction component including a pair of spaced apart Y reaction masses, the X reaction component moving

relative to the Y reaction component along an X axis, the X reaction component and the Y reaction component moving concurrently along a Y axis relative to the stage base, the reaction mass assembly being adapted to reduce the reaction forces in at least two degrees of freedom that are transferred to the stage base; and a mass guide assembly that connects the X reaction masses to the Y reaction masses, allows the X reaction masses to move independently relative to the Y reaction masses along the X axis and inhibits movement of the X reaction masses relative to the Y reaction masses along the Y axis.” These features are not taught or suggested by the cited references. Thus, claim 23 is considered to be patentable.

Amended claim 47 is directed towards a stage assembly that requires a stage adapted to retain the device; a stage mover assembly connected to the stage, the stage mover assembly moving the stage along an X axis and along a Y axis and generating reaction forces along the X axis and along the Y axis; a reaction mass assembly coupled to the stage mover assembly, the reaction mass assembly being adapted to reduce the reaction forces along the X axis and along the Y axis, the reaction mass assembly including an X reaction component and a Y reaction component, the X reaction component moving relative to the stage base along the X axis, the X reaction component moving relative to the Y reaction component along the X axis and along the Y axis, and the X reaction component and the Y reaction component move concurrently along the Y axis; and a reaction mover assembly that adjusts (i) the position of the X reaction component relative to the Y reaction component along the X axis, (ii) the position of the Y reaction component and the X reaction component relative to the stage base along the Y axis, and (iii) the position of the Y reaction component and the X reaction component relative to the stage base along the X axis.” These features are not taught or suggested by the cited references. Thus, claim 47 is believed to be patentable.

Further, amended claim 52 is directed towards a stage assembly that requires “a stage adapted to retain the device; a stage mover assembly connected to the stage, the stage mover assembly moving the stage along an X axis and along a Y axis and generating reaction forces along the X axis and along the Y axis; a reaction mass assembly coupled to the stage mover assembly, the reaction mass assembly being adapted to reduce the reaction forces along the X axis and along the Y axis, the reaction

mass assembly including a X reaction component and a Y reaction component, the X reaction component including a first X reaction mass and a second X reaction mass that move independently along the X axis relative to the Y reaction component, the X reaction component moving relative to the stage base along the X axis and along the Y axis, the X reaction component and the Y reaction component moving concurrently along the Y axis, and the Y reaction component including a pair of spaced apart Y reaction masses; and a mass guide assembly that connects the X reaction masses to the Y reaction masses, allows the X reaction masses to move independently relative to the Y reaction masses along the X axis and inhibits movement of the X reaction masses relative to the Y reaction masses along the Y axis.” These features are not taught or suggested by the cited references. Thus, claim 52 is considered to be patentable. Because claim 53 depends from claim 52, it is also believed to be patentable.

Amended claim 80 is directed toward a method for making a stage assembly that requires the steps of “providing a stage that retains the device; connecting a stage mover assembly to the stage, the stage mover assembly moving the stage with at least two degrees of freedom and generating reaction forces in at least two degrees of freedom; and coupling a reaction mass assembly to the stage mover assembly, the reaction mass assembly including a first X reaction mass, a second X reaction mass and a reaction frame, the first X reaction mass and the second X reaction mass moving independently along an X axis, the reaction mass assembly reducing the reaction forces in at least two degrees of freedom that are transferred to the stage base, the reaction frame being coupled to the X reaction masses so that the reaction frame moves relative to the stage base along the X axis.” These steps are not taught or suggested by the cited references. Thus, claim 80 is considered to be patentable. Because claims 81 and 82 depend from claim 80, they are likewise considered to be patentable.

Therefore, the Applicants respectfully request that the rejection of claims 12, 20, 23, 47, 52, 53 and 80-82 be withdrawn, and that these claims be allowed.

Rejections Under 35 U.S.C. § 103

Claims 35, 36, 64 and 65 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsui et al and further in view of Horikawa et al (US 5,991,005). As

provided above, claims 35, 36, 64 and 65 have been canceled without prejudice by this amendment. Therefore, the rejection of the Patent Office under 35 U.S.C. § 103(a) is believed to be moot.

Remaining New Claims

New claims 99-247 have also been added by this amendment. New claims 99-247 are of a slightly different scope than the previously pending claims. However, in view of the cited references, claims 99-247 are believed to be patentable.

In addition to the description of Matsui et al provided above, Matsui et al does not teach or suggest using a Y reaction component that supports an X reaction component. Further, Matsui et al does not teach or suggest using an X reaction component and/or a Y reaction component that are moved about a Z axis by a reaction mover assembly. Additionally, Matsui et al does not teach or suggest using an X reaction component that moves relative to a Y reaction component along an X axis, and which does not move relative to the Y reaction component along the Y axis, i.e. both reaction components move concurrently in the same direction along the Y axis.

The device in Loopstra et al includes a balancing unit 69 which is repositioned relative to the base 81 using anti-drift means 89 that include the use of one or more mechanical springs 91, 93, 95, that exert a force on the balancing unit 69. (Col. 14, line 58 through Col. 15, line 16). The mechanical springs 91, 93 move the balancing unit 69 in the X-direction, while the mechanical spring 95 moves the balancing unit 69 in the Y-direction. The positioning device 3 disclosed in Loopstra et al does not teach or suggest using anti-drift means 89 that move the balancing unit 69 about the Z axis, or with more than two degrees of freedom. Additionally, Loopstra et al does not teach or suggest using a plurality of reaction masses that move relative to each other.

In contrast to the cited references, new claim 99 is directed towards a stage assembly that requires "a stage that retains the device; a stage mover assembly connected to the stage, the stage mover assembly moving the stage with at least two degrees of freedom and generating a reaction force along a Y axis; and a reaction mass assembly coupled to the stage mover assembly, the reaction mass assembly including an X reaction component and a Y reaction component, the X reaction component moving

relative to the Y reaction component, the reaction components moving along the Y axis to reduce the reaction force along the Y axis that is transferred to the stage base.” These features are not taught or suggested by the cited references. Thus, claim 99 is believed to be patentable. Because claims 100-130 depend directly or indirectly from claim 99, they are also believed to be patentable.

New claim 131 requires “a stage that retains the device; a stage mover assembly connected to the stage, the stage mover assembly moving the stage with at least two degrees of freedom and generating reaction forces; a reaction mass assembly coupled to the stage mover assembly, the reaction mass assembly reducing the reaction forces in at least one degree of freedom that is transferred to the stage base, the reaction mass assembly including a Y reaction component and an X reaction component that moves relative to the Y reaction component, one of the reaction components moving about a Z axis relative to the stage base.” These features are not taught or suggested by the cited references. Thus, claim 131 is believed to be patentable. Because claims 132-162 depend directly or indirectly from claim 131, they are also believed to be patentable.

The Patent Office stated that a “reaction mass assembly including an X component of two spaced apart X reaction masses and a Y reaction component shaped as a generally planar reaction base ... is not shown in the prior art.” The Applicants agree with the statement from the Patent Office. Further, the cited references do not teach or suggest an X reaction component and a Y reaction component shaped as a generally planar reaction base. Thus, new claim 163 is directed towards a stage assembly that requires “a stage that retains the device; a stage mover assembly connected to the stage, the stage mover assembly moving the stage with at least two degrees of freedom and generating reaction forces in at least two degrees of freedom; and a reaction mass assembly including an X reaction component and a Y reaction component that are coupled to the stage mover assembly, the X reaction component moving relative to the Y reaction component, the Y reaction component including a generally planar shaped reaction base, the reaction mass assembly reducing the reaction forces in at least two degrees of freedom that are transferred to the stage base.” These features are not taught or suggested by the cited references. Thus, claim 163 is believed to be patentable.

Because claims 164-185 depend directly or indirectly from claim 163, they are also considered to be patentable.

Moreover, the Patent Office stated that a “reaction mass assembly including an X component of two spaced apart X reaction masses and a Y reaction component shaped as a reaction frame ... is not shown in the prior art.” The Applicants agree with the statement from the Patent Office. Further, the cited references do not teach or suggest an X reaction component and a Y reaction component shaped as a reaction frame. Thus, new claim 186 requires “a stage that retains the device; a stage mover assembly connected to the stage, the stage mover assembly moving the stage with at least two degrees of freedom and generating reaction forces in at least two degrees of freedom; and a reaction mass assembly including an X reaction component and a Y reaction component that are coupled to the stage mover assembly, the Y reaction component including a reaction frame, the X reaction component moving relative to the Y reaction component, the reaction mass assembly reducing the reaction forces in at least two degrees of freedom that are transferred to the stage base.” These features are not taught or suggested by the cited references. Thus, claim 186 is considered to be patentable. Because claims 187-205 depend directly or indirectly from claim 186, they are likewise considered to be patentable.

New claim 206 requires “a stage that retains the device; a stage mover assembly connected to the stage, the stage mover assembly moving the stage with at least two degrees of freedom and generating reaction forces in at least two degrees of freedom; and a reaction mass assembly including an X reaction component and a Y reaction component that are coupled to the stage mover assembly, the X reaction component moving relative to the Y reaction component, the Y reaction component supporting at least a portion of the X reaction component, the reaction mass assembly reducing the reaction forces in at least two degrees of freedom that are transferred to the stage base.” These features are not taught or suggested by the cited references. Thus, claim 206 is believed to be patentable. Because claims 207-230 depend directly or indirectly from claim 206, they are also believed to be patentable.

Further, new claim 231 is directed towards a method for making a stage assembly that requires the steps of “retaining the device with a stage; generating reaction forces by

moving the stage with two degrees of freedom with a stage mover assembly; coupling a reaction mass assembly to the stage mover assembly, the reaction mass assembly including a Y reaction component and an X reaction component that moves relative to the Y reaction component, the reaction mass assembly reducing the reaction forces that are transferred to the stage base; and adjusting the position of at least one of the reaction components relative to the stage base about a Z axis with a reaction mover assembly.” These steps are not taught or suggested by the cited references. Thus, claim 231 is believed to be patentable. Because claims 232-247 depend directly or indirectly from claim 231, they are also believed to be patentable.

Version with markings to show changes made

In th Specification:

The paragraph beginning on page 1, line 14, has been amended as follows:

As far as permitted, the disclosures of (i) U.S. Patent Application Serial No. [] 09/714,598, entitled, "A SYSTEM AND METHOD FOR RESETTING A REACTION MASS ASSEMBLY OF A STAGE ASSEMBLY," filed on [the same day as the present Application, docket no. PA0293-US / 11269.14] November 16, 2000, (ii) U.S. Patent Application Serial No. [] 09/713,911, entitled "STAGE ASSEMBLY INCLUDING A REACTION ASSEMBLY," filed on [the same day as the present Application, docket no. PA0283-US / 11269.17] November 16, 2000, and (iii) U.S. Patent Application Serial No. [] 09/713,910, entitled "STAGE ASSEMBLY INCLUDING A REACTION ASSEMBLY THAT IS CONNECTED BY ACTUATORS," filed on [the same day as the present Application, docket no. PA0319-US / 11269.25] November 16, 2000, are incorporated herein by reference.

In the Claims:

Claims 12, 20, 23, 28, 47, 52, 57 and 80 have been amended as follows:

12. (First Amended) A stage assembly that is adapted to move a device relative to a stage base, the stage assembly comprising:

a stage adapted to retain the device;

a stage mover assembly connected to the stage, the stage mover assembly moving the stage with at least two degrees of freedom and generating reaction forces in at least two degrees of freedom;

a reaction mass assembly coupled to the stage mover assembly, the reaction mass assembly being adapted to reduce the reaction forces in at least two degrees of freedom that are transferred to the stage base; and

a reaction mover assembly that adjusts the position of the reaction mass assembly relative to the stage base along an X axis, along a Y axis and [The stage assembly of claim 11 wherein the reaction mover assembly adjusts the position of the reaction mass assembly relative to the stage base] about a Z axis.

20. (First Amended) A stage assembly that is adapted to move a device relative to a stage base, the stage assembly comprising:

a stage adapted to retain the device;

a stage mover assembly connected to the stage, the stage mover assembly moving the stage with at least two degrees of freedom and generating reaction forces in at least two degrees of freedom;

a reaction mass assembly including an X reaction component and a Y reaction component that are coupled to the stage mover assembly, the X reaction component moving relative to the Y reaction component along an X axis, the X reaction component and the Y reaction component moving concurrently along a Y axis relative to the stage base, the reaction mass assembly being adapted to reduce the reaction forces in at least two degrees of freedom that are transferred to the stage base; and

[The stage assembly of claim 13 further comprising] a mass guide assembly that allows the X reaction component to move relative to the Y reaction component along the X axis and inhibits movement of the X reaction component relative to the Y reaction component along the Y axis.

23. (First Amended) A stage assembly that is adapted to move a device relative to a stage base, the stage assembly comprising:

a stage adapted to retain the device;

a stage mover assembly connected to the stage, the stage mover assembly moving the stage with at least two degrees of freedom and generating reaction forces in at least two degrees of freedom;

a reaction mass assembly including an X reaction component and a Y reaction component that are coupled to the stage mover assembly, the X reaction component including a pair of spaced apart X reaction masses and the Y reaction component including a pair of spaced apart Y reaction masses, the X reaction component moving relative to the Y reaction component along an X axis, the X reaction component and the Y reaction component moving concurrently along a Y axis relative to the stage base, the reaction mass assembly being adapted to reduce the reaction forces in at least two degrees of freedom that are transferred to the stage base; and

[The stage assembly of claim 22 further comprising] a mass guide assembly that connects the X reaction masses to the Y reaction masses, allows the X reaction masses to move independently relative to the Y reaction masses along the X axis and inhibits movement of the X reaction masses relative to the Y reaction masses along the Y axis.

28. (First Amended) The stage assembly of claim [27] 93 further comprising a mass guide assembly that connects the X reaction masses to the reaction frame, allows the X reaction masses to move independently relative to the reaction frame along the X axis and inhibits movement of the X reaction masses relative to the reaction frame along the Y axis.

47. (First Amended) A stage assembly that is adapted to move a device relative to a stage base, the stage assembly comprising:

a stage adapted to retain the device;

a stage mover assembly connected to the stage, the stage mover assembly moving the stage along an X axis and along a Y axis and generating reaction forces along the X axis and along the Y axis;

a reaction mass assembly coupled to the stage mover assembly, the reaction mass assembly being adapted to reduce the reaction forces along the X axis and along the Y axis, the reaction mass assembly including an X reaction component and a Y reaction component, the X reaction component moving relative to the stage base along the X axis, the X reaction component moving relative to the Y reaction component along the X axis and along the Y axis, and the X reaction component and the Y reaction component move concurrently along the Y axis; and

a reaction mover assembly that adjusts (i) the position of the X reaction component relative to the Y reaction component along the X axis, (ii) the position of the Y reaction component and the X reaction component relative to the stage base along the Y axis, and (iii) [The stage assembly of claim 46 wherein the reaction mover assembly adjusts] the position of the Y reaction component and the X reaction component relative to the stage base along the X axis.

52. (First Amended) A stage assembly that is adapted to move a device relative to a stage base, the stage assembly comprising:

a stage adapted to retain the device;

a stage mover assembly connected to the stage, the stage mover assembly moving the stage along an X axis and along a Y axis and generating reaction forces along the X axis and along the Y axis;

a reaction mass assembly coupled to the stage mover assembly, the reaction mass assembly being adapted to reduce the reaction forces along the X axis and along the Y axis, the reaction mass assembly including a X reaction component and a Y reaction component, the X reaction component including a first X reaction mass and a second X reaction mass that move independently along the X axis relative to the Y reaction component, the X reaction component moving relative to the stage base along the X axis and along the Y axis, the X reaction component and the Y reaction component moving concurrently along the Y axis, and the Y reaction component including a pair of spaced apart Y reaction masses; and

[The stage assembly of claim 51 further comprising] a mass guide assembly that connects the X reaction masses to the Y reaction masses, allows the X reaction masses to move independently relative to the Y reaction masses along the X axis and inhibits movement of the X reaction masses relative to the Y reaction masses along the Y axis.

57. (First Amended) The stage assembly of claim [56] 97 further comprising a mass guide assembly that connects the X reaction masses to the reaction frame, allows the X reaction masses to move independently relative to the reaction frame along the X axis, and inhibits movement of the X reaction masses relative to the reaction frame along the Y axis.

80. (First Amended) A method for making a stage assembly that moves a device relative to a stage base, the method comprising the steps of:

providing a stage that retains the device;

connecting a stage mover assembly to the stage, the stage mover assembly moving the stage with at least two degrees of freedom and generating reaction forces in at least two degrees of freedom; and

coupling a reaction mass assembly to the stage mover assembly, the reaction mass assembly including a first X reaction mass, a second X reaction mass and a reaction frame, the first X reaction mass and the second X reaction mass moving independently along an X axis, the reaction mass assembly reducing the reaction forces in at least two degrees of freedom that are transferred to the stage base, [The method of claim 79 wherein the step of providing a reaction mass assembly includes the step of providing a] the reaction frame [that is] being coupled to the X reaction masses so that the reaction frame moves relative to the stage base along the X axis.

Claims 1-11, 13-19, 21, 22, 24-27, 35-46, 48-51, 54-56, 64-79 and 83-89 have been canceled without prejudice.

Claims 90-247 have been added.

Remaining References

The references cited by the Examiner, but not relied on for the rejection of claims, have been noted. The remaining references are no more pertinent than the applied references, therefore, a detailed discussion of these remaining references is deemed unnecessary for a full and complete response to the Office Action.

CONCLUSION

In conclusion, the Applicant respectfully asserts that claims 12, 20, 23, 28-34, 47, 52, 53, 57-63, 80-82 and 90-247 are patentable for the reasons set forth above, and that the application is now in a condition for allowance. Accordingly, an early notice of allowance is respectfully requested. The Examiner is requested to call the undersigned at 858-456-1951 for any reason that would advance the instant application to issue.

Dated this 14th day of February, 2003.

Respectfully submitted,



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